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(54) **CUSHION SLEEVE**

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B65D 63/10	(2006.01)
H02G 3/30	(2006.01)

(52) **U.S. Cl.**

CPC . ***H02G 3/30*** (2013.01); *Y10T 24/14* (2015.01); *Y10T 24/1498* (2015.01)

(58) **Field of Classification Search**

CPC F16L 3/233; F16L 3/137; B65D 63/10; B65D 33/1675; B65D 63/1072; A63B 2005/163; H02G 3/30

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See application file for complete search history.

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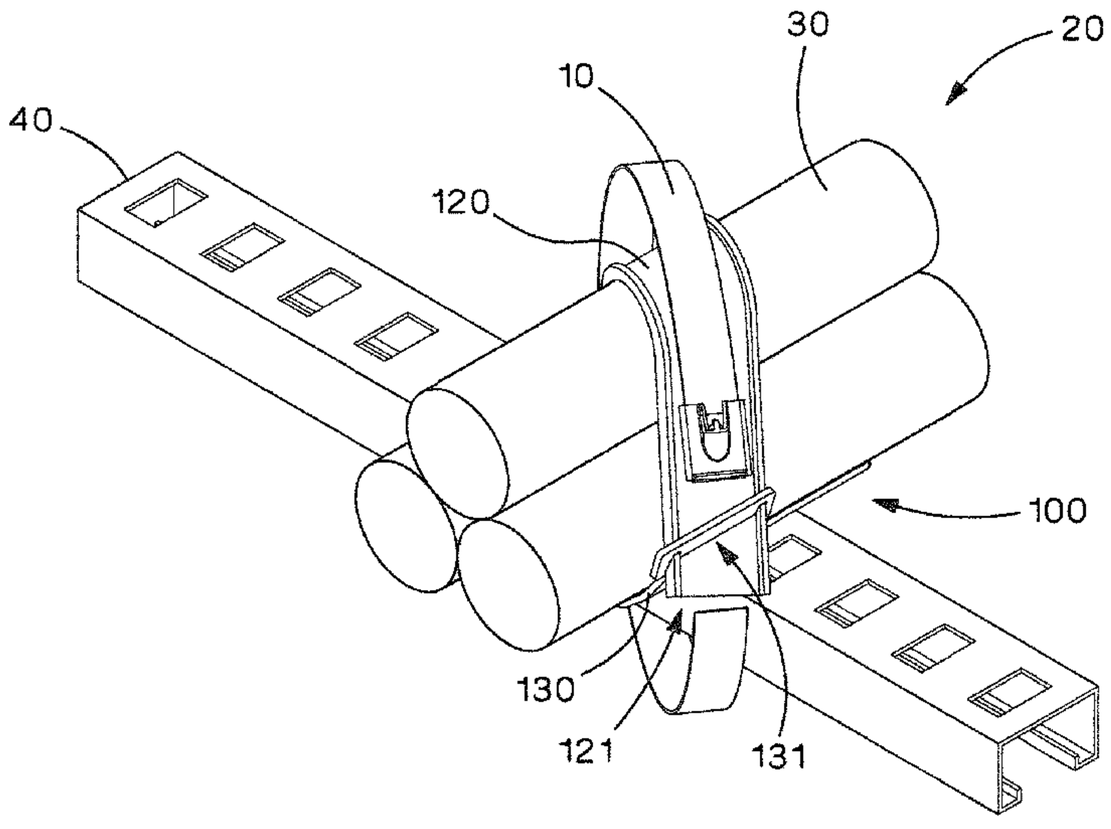
(57) **ABSTRACT**

A cushion sleeve for a cable tie is provided. The cushion sleeve includes a body for receiving a bundle of cables. The body includes a first side and a second side opposite the first side. Additionally, the cushion sleeve includes a first arm extending from the first side of the body along a first axis and a second arm extending from the second side of the body along a second axis. The first axis is oblique to the second axis when the cushion sleeve is unwrapped such that the first arm engages the second arm when the cushion sleeve is wrapped around the bundle of cables.

24 Claims, 10 Drawing Sheets



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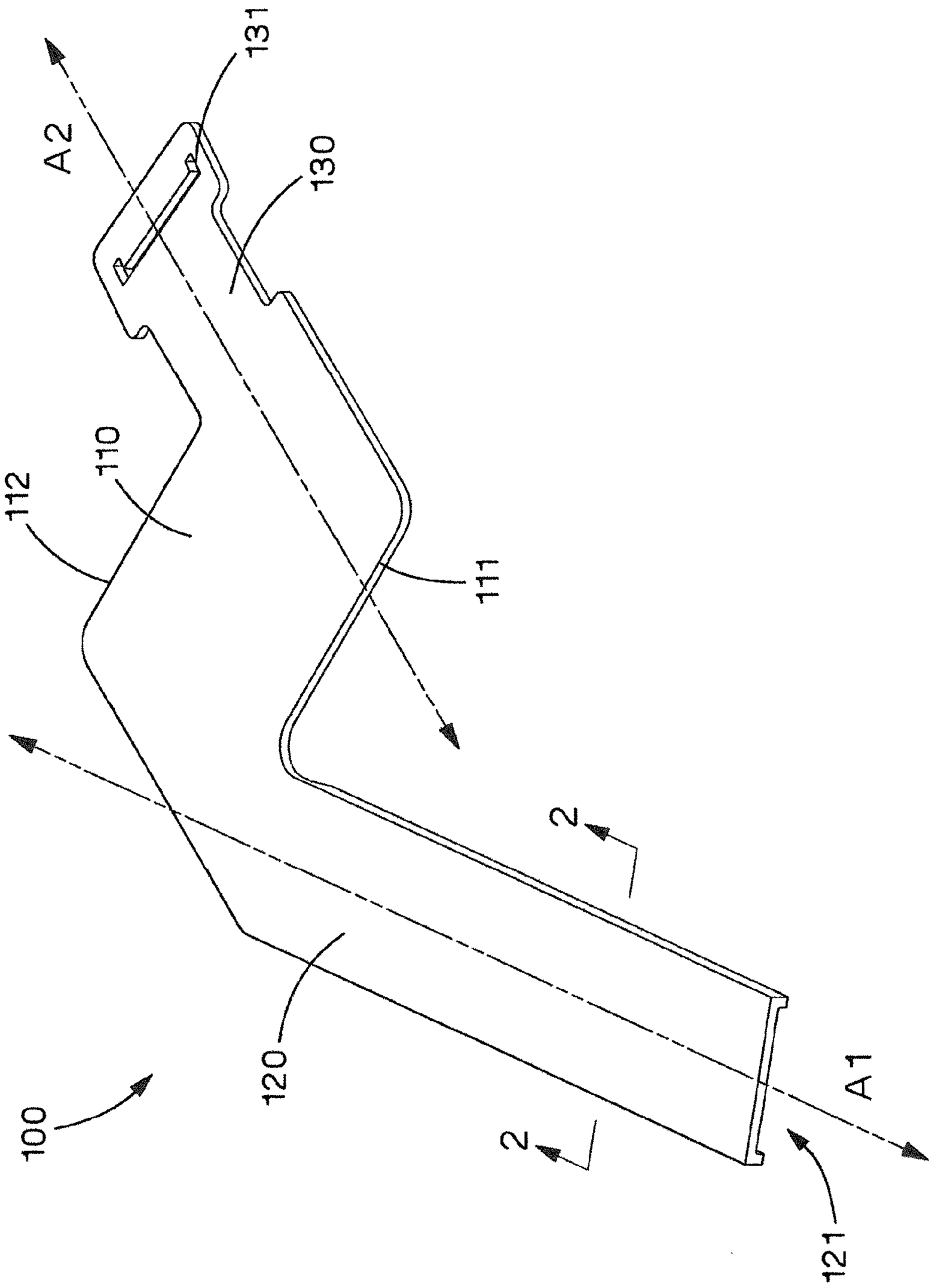

FIG.1A

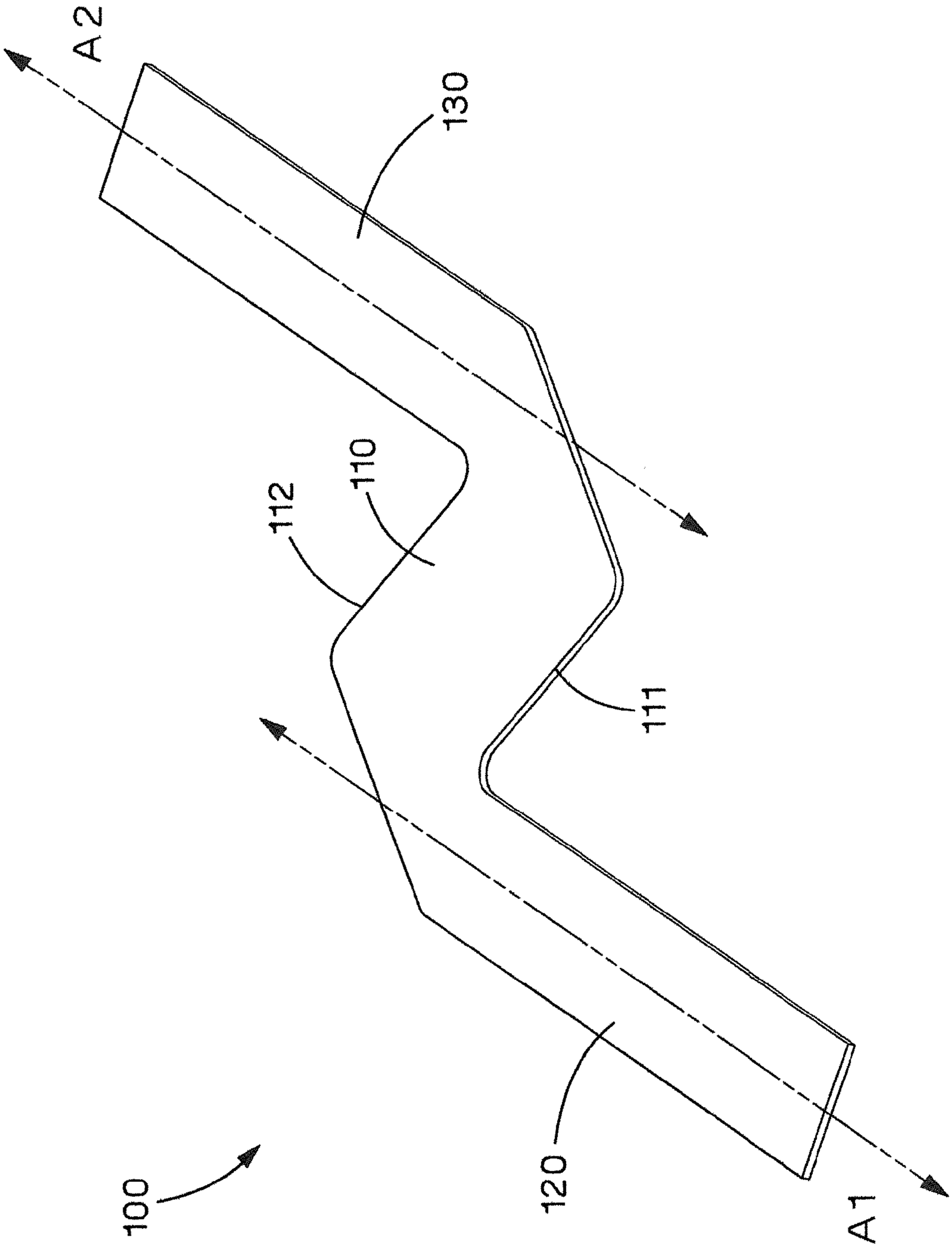

FIG. 1B

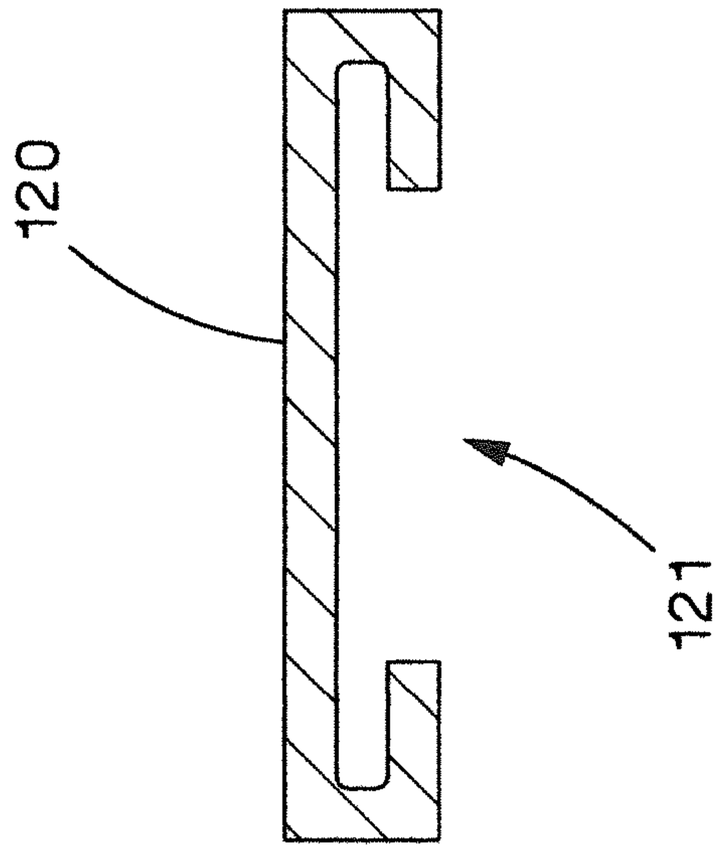

FIG.2B

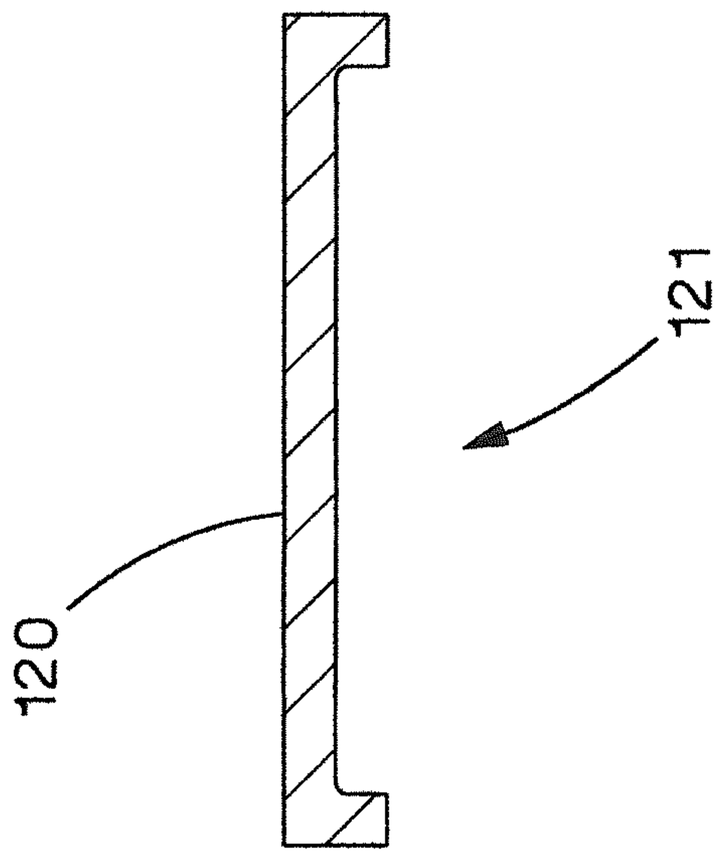

FIG.2A

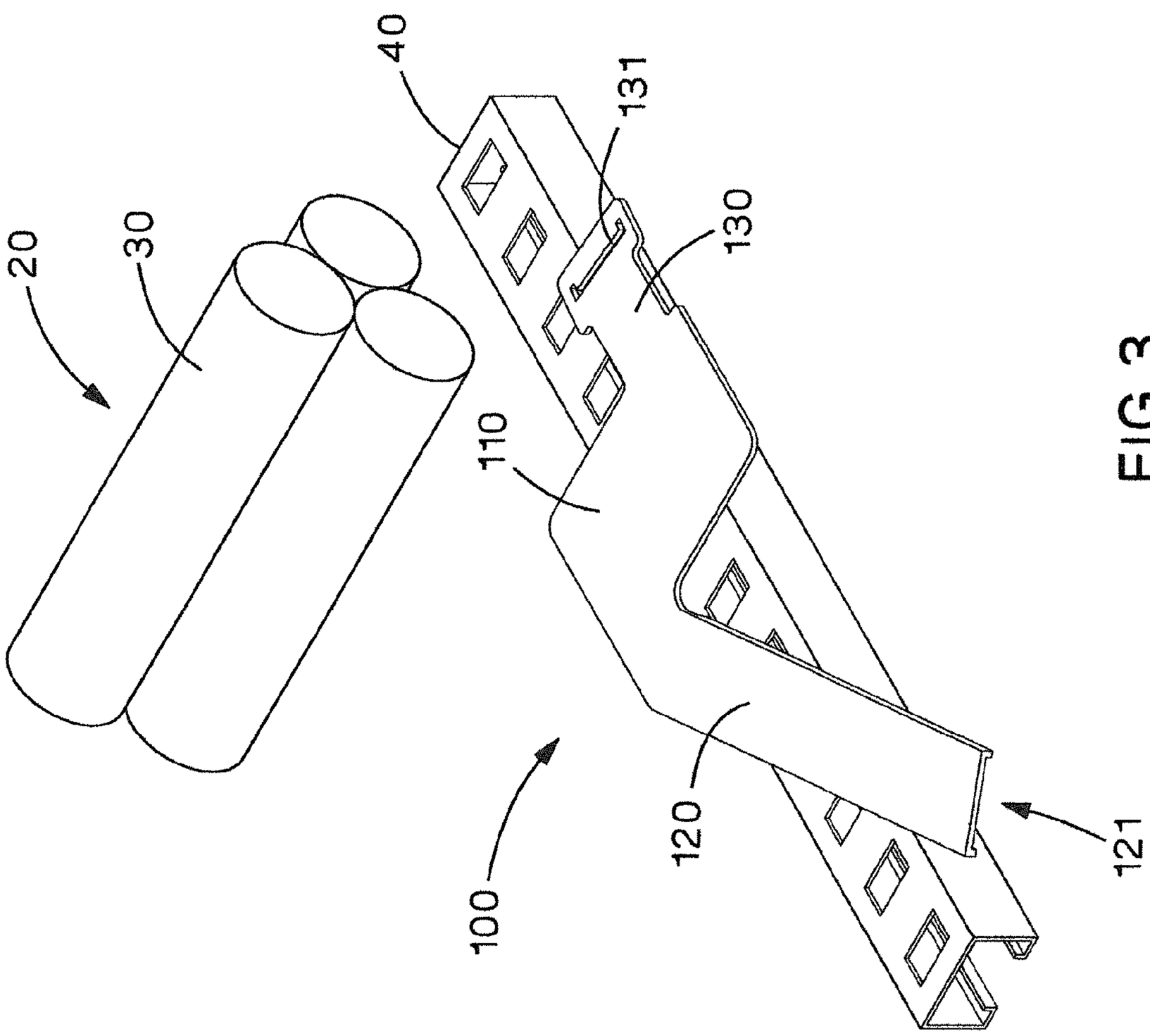

FIG.3

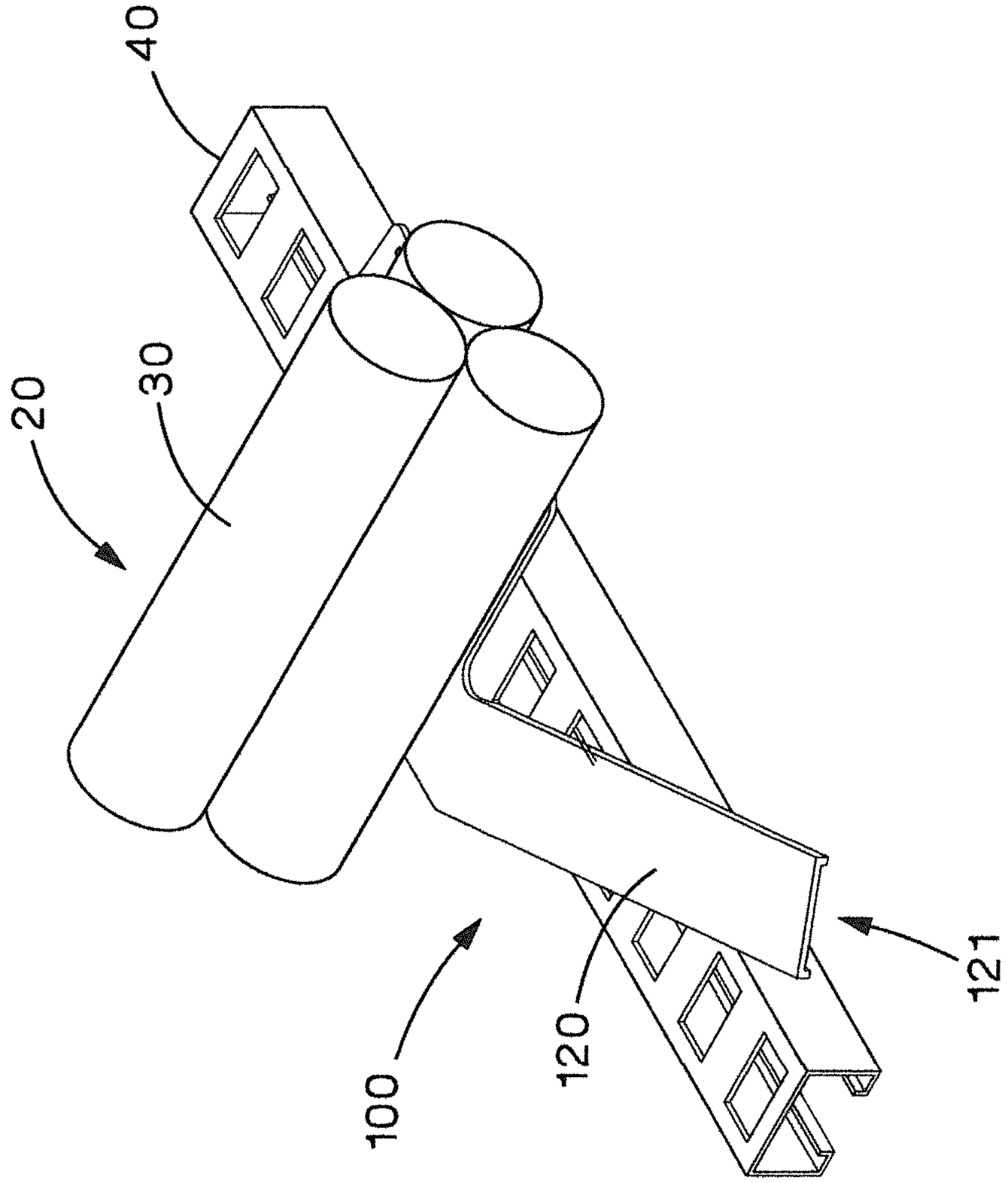

FIG.4

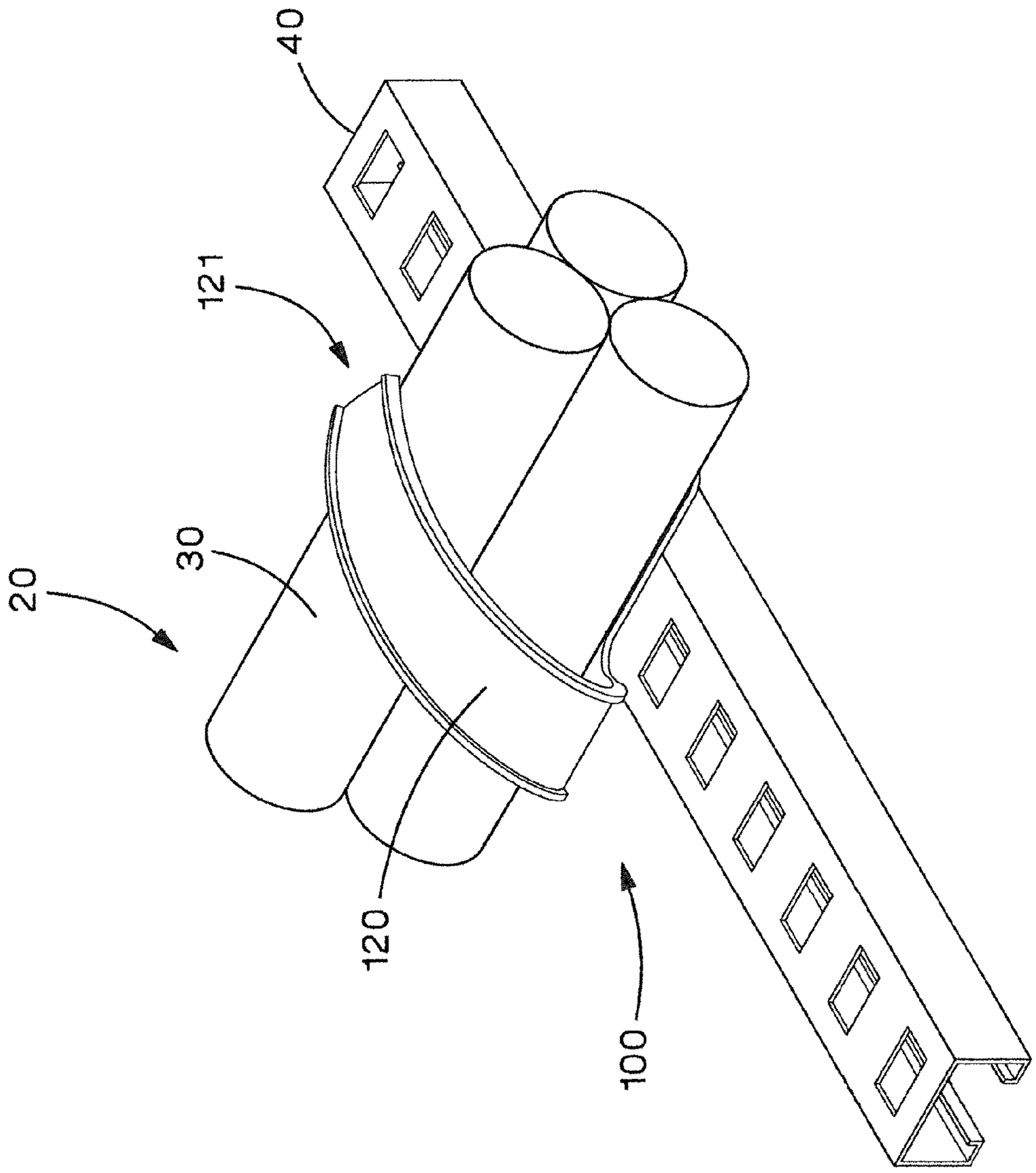

FIG.5

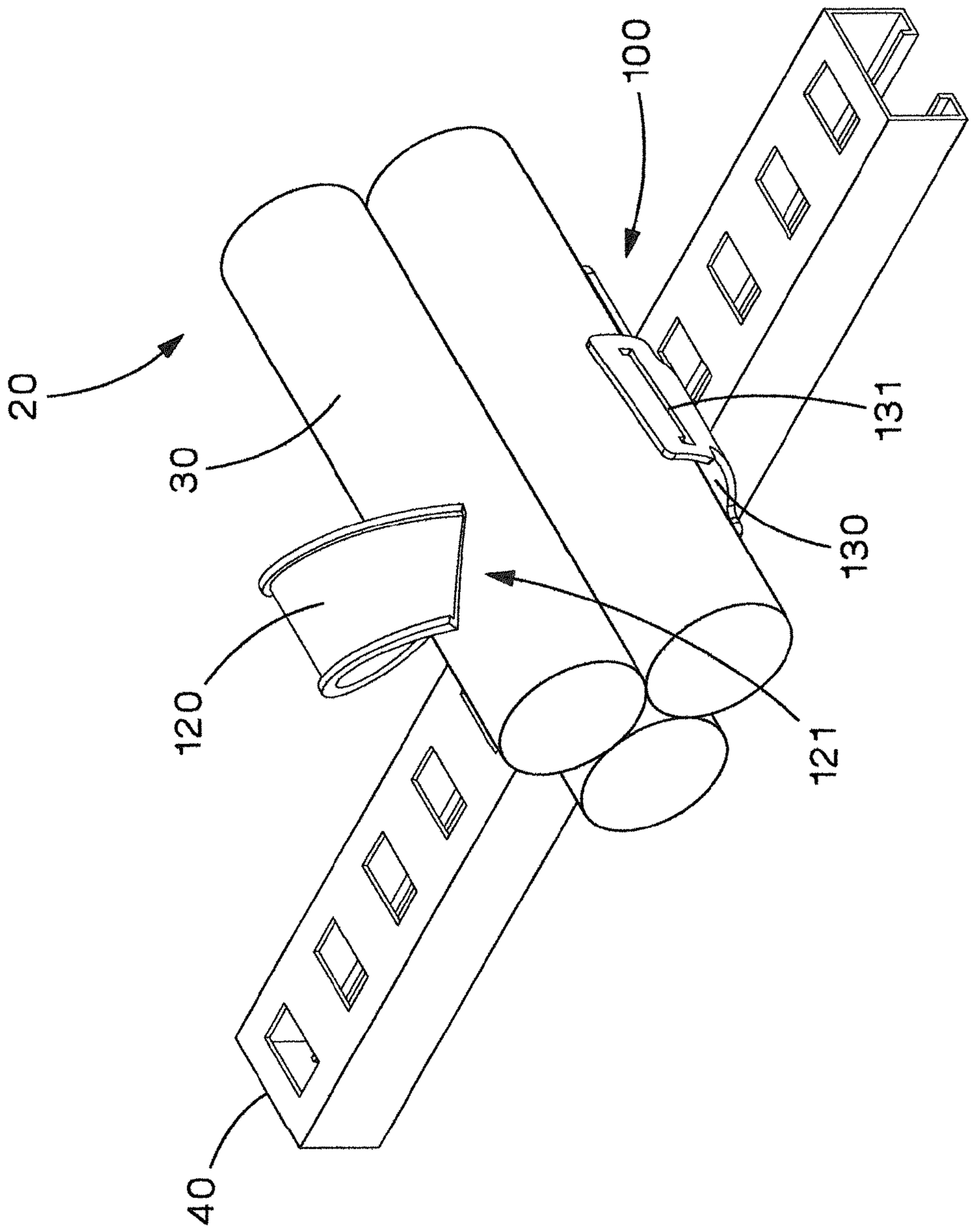

FIG.6

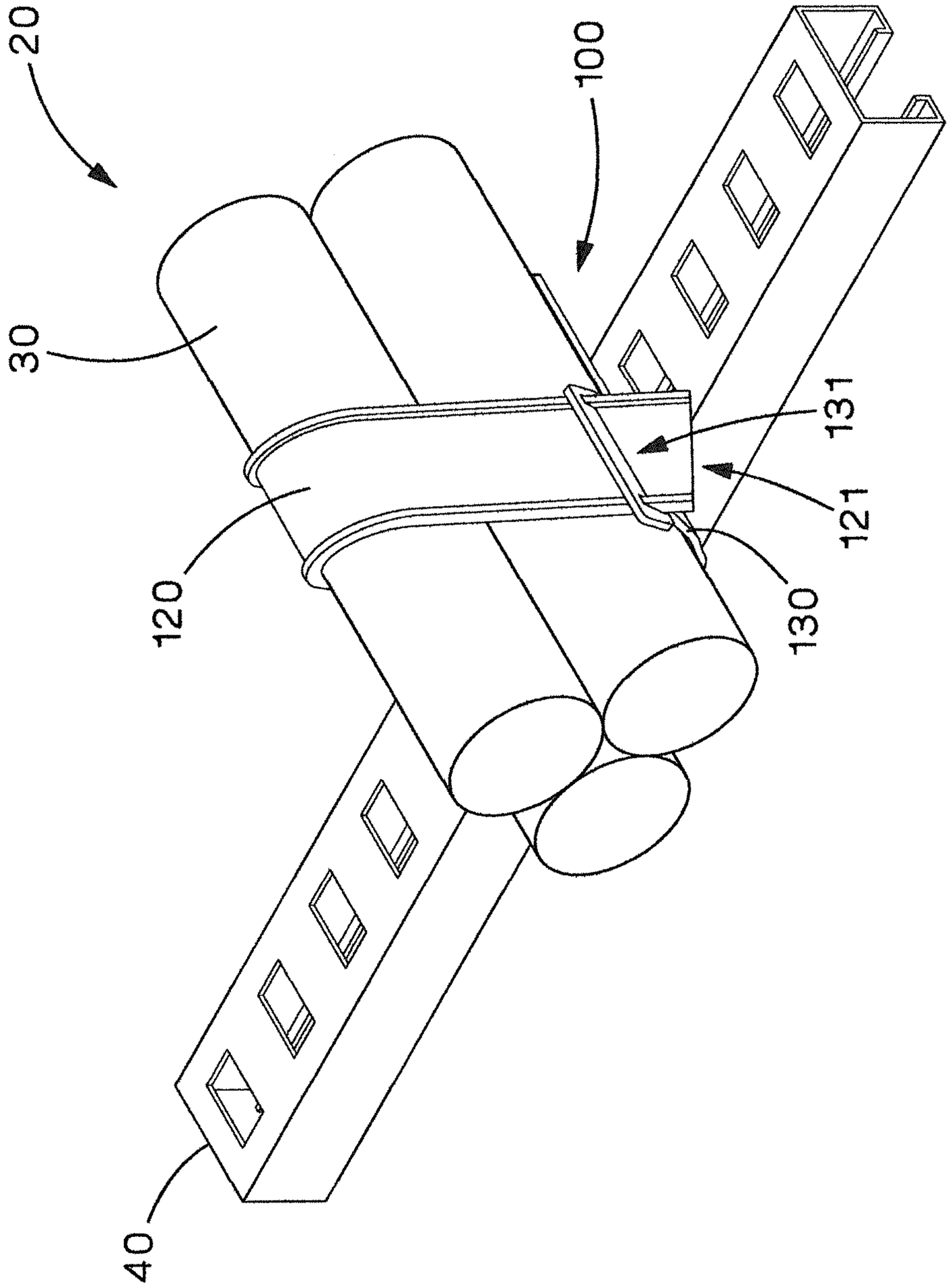

FIG. 7

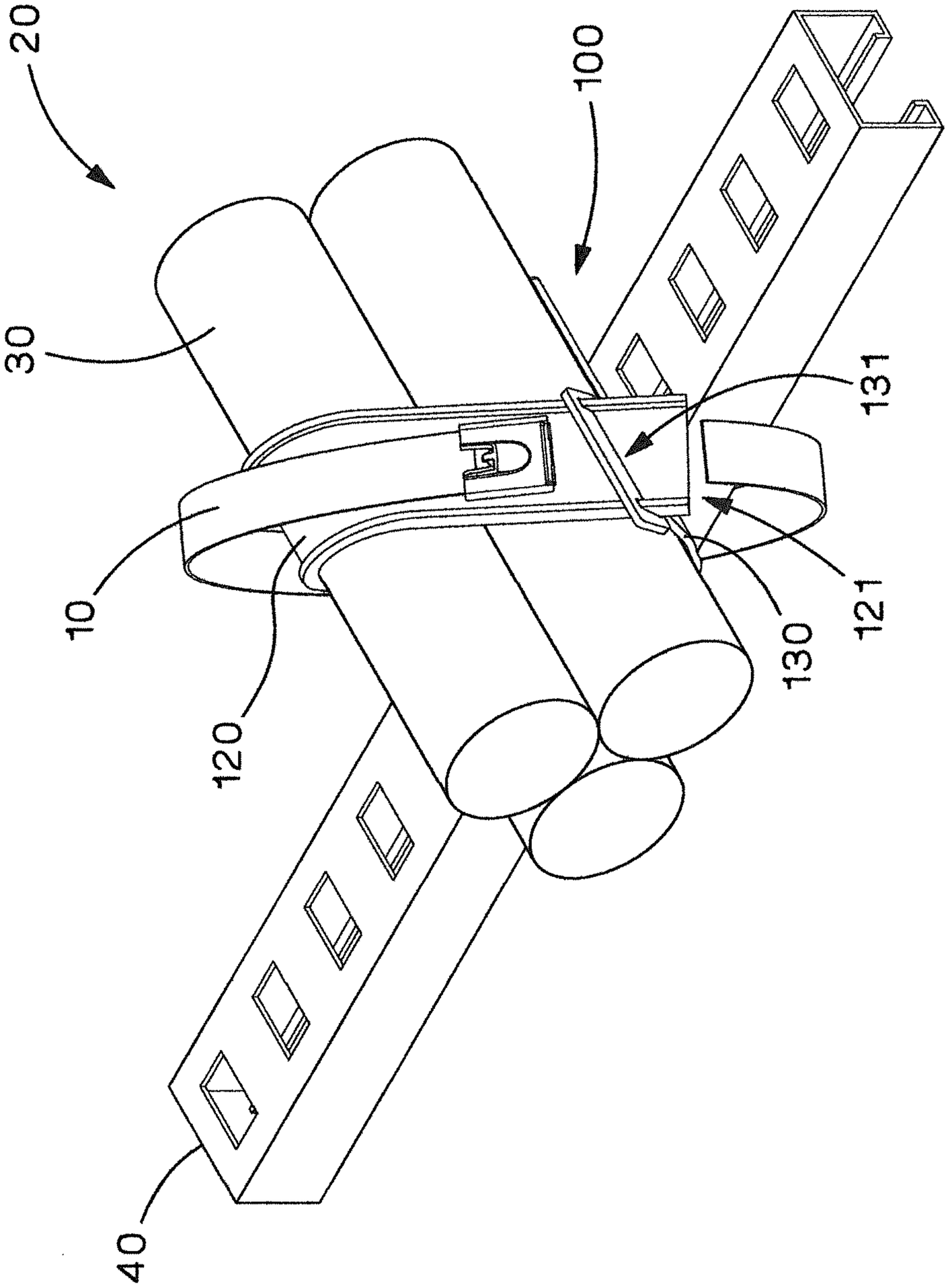

FIG.8

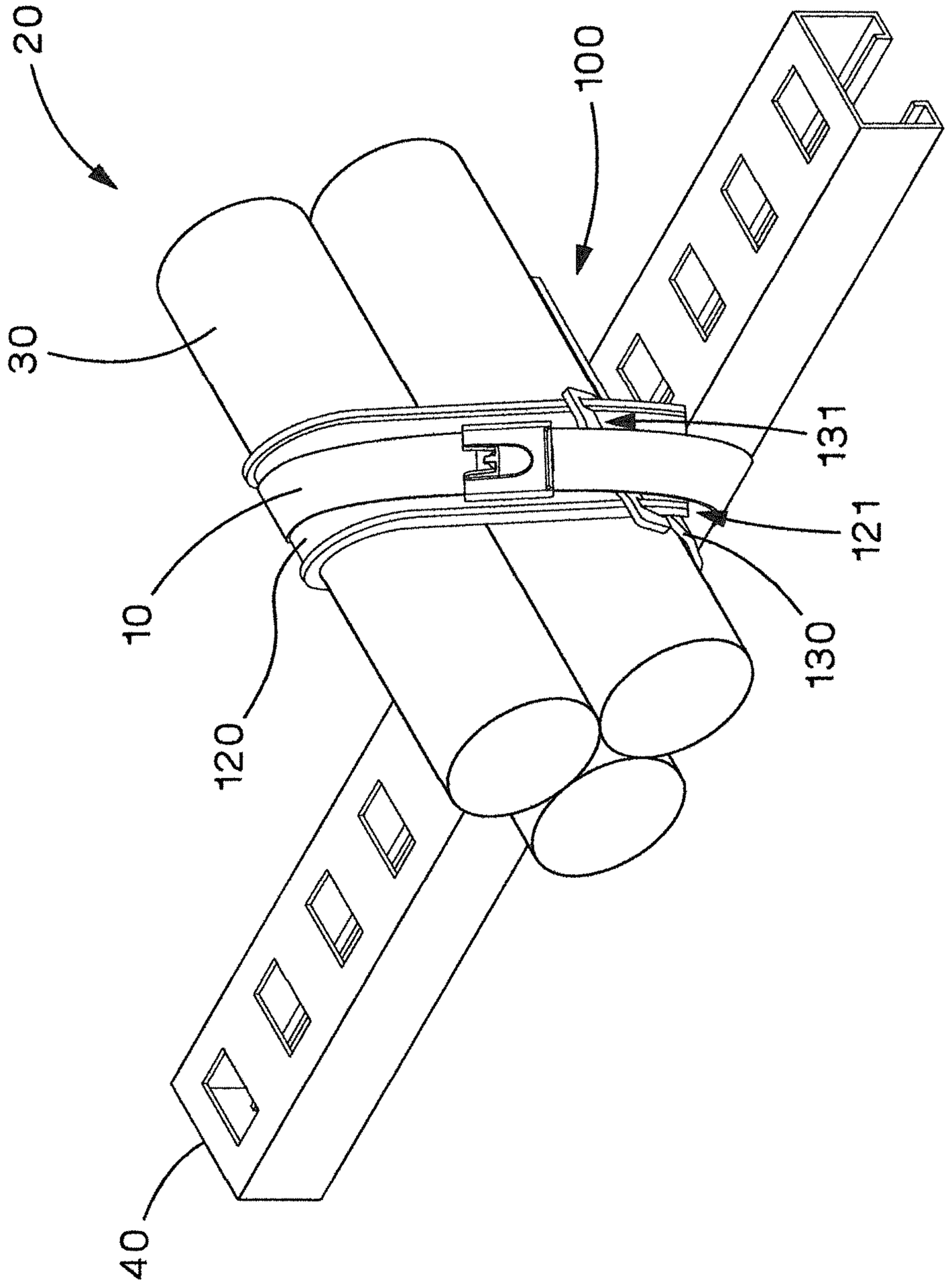

FIG.9

CUSHION SLEEVE

BACKGROUND OF THE INVENTION

The present invention relates to a cushion sleeve for a cable tie, and more particularly, a cushion sleeve for a cable tie installed diagonally about a bundle of cables and an adjacent support member that is affordable and easy to install.

Cushion sleeves for cable ties are well known in the art. For example, existing cushion sleeves, such as Panduit's PCS Cushion Sleeves, are for cable ties, such as Panduit's Pan-Steel® Cable Ties, installed perpendicular to a bundle of cables and parallel to an adjacent support member, such as a rung of a ladder rack. The cushion sleeve protects the bundle of cables from being damaged by the cable ties, for example, during a short circuit event. However, it is difficult to install cable ties in this manner because of variations in rung design, as well as the proximity of other obstructions.

Cable cleats are also well known in the art. For example, existing cable cleats, such as Ellis Patents' Vulcan and Emperor Cable Cleats, provide an alternative to cable ties and cushion sleeves for cable ties. However, cable cleats are expensive and difficult to install because cable cleats typically require additional mounting hardware that has been configured for a specific cable routing system.

Cable ties are more affordable and easier to install than cable cleats because, unlike cable cleats, cable ties do not require any additional mounting hardware, much less additional mounting hardware that has been configured for a specific cable routing system.

Additionally, it is easier to install cable ties diagonally about the bundle of cables and the adjacent support member than perpendicular to a bundle of cables and parallel to an adjacent support member. However, when cable ties are installed in this manner, there is more risk of damage to the bundle of cables because the bundle of cables is exposed to the edges of the cable tie.

Therefore, there is a need for a cushion sleeve for a cable tie installed diagonally about a bundle of cables and an adjacent support member that is affordable and easy to install.

SUMMARY OF THE INVENTION

Certain embodiments of the present invention provide a cushion sleeve for a cable tie. The cushion sleeve includes a body for receiving a bundle of cables. The body includes a first side and a second side opposite the first side. Additionally, the cushion sleeve includes a first arm extending from the first side of the body along a first axis and a second arm extending from the second side of the body along a second axis. The first axis is oblique to the second axis when the cushion sleeve is unwrapped such that the first arm engages the second arm when the cushion sleeve is wrapped around the bundle of cables.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1**A is first side perspective view of a cushion sleeve for a cable tie installed diagonally about a bundle of cables and an adjacent support member according to an embodiment of the present invention;

FIG. **1**B is first side perspective view of a cushion sleeve for a cable tie installed diagonally about a bundle of cables and an adjacent support member according to an alternative embodiment of the present invention;

FIG. **2**A is a cross-sectional view taken along line **2-2** of FIG. **1**, showing a U-shaped channel for receiving the cable tie;

FIG. **2**B is a cross-sectional view similar to the cross-sectional view of FIG. **2**A, showing a C-shaped channel for receiving the cable tie according to an alternative embodiment of the present invention;

FIG. **3** is a first side perspective view of the cushion sleeve of FIG. **1**, showing the cushion sleeve positioned on the support member;

FIG. **4** is a first side perspective view of the cushion sleeve of FIG. **1**, showing the bundle of cables positioned on a body of the cushion sleeve;

FIG. **5** is a first side perspective view of the cushion sleeve of FIG. **1**, showing a first arm positioned around the bundle of cables;

FIG. **6** is a second side perspective view of the cushion sleeve of FIG. **1**, showing a second arm positioned around the bundle of cables;

FIG. **7** is a second side perspective view of the cushion sleeve of FIG. **1**, showing the cushion sleeve secured around the bundle of cables;

FIG. **8** is a second side perspective view of the cushion sleeve of FIG. **1**, showing the cable tie positioned around the cushion sleeve, the bundle of cables, and the support member; and

FIG. **9** is a second side perspective view of the cushion sleeve of FIG. **1**, showing the cable tie secured around the cushion sleeve, the bundle of cables, and the support member.

DETAILED DESCRIPTION

FIGS. **1-9** illustrate a cushion sleeve **100** for a cable tie **10**, such as Panduit's Pan-Steel® Cable Ties, installed diagonally about a bundle **20** of cables **30** and an adjacent support member **40**, such as a rung of a ladder rack, according to several embodiments of the present invention.

As shown in FIG. **1**A, the cushion sleeve **100** includes a body **110** for receiving a bundle **20** of cables **30**. The body **110** includes a first side **111** and a second side **112** opposite the first side **111**. Preferably, the body **110** is rectangular, but it is likewise contemplated that the body **110** is elliptical or any other suitable shape for receiving the bundle **20** of cables **30**.

Additionally, as shown in FIG. **1**A, the cushion sleeve **100** includes a first arm **120** extending from the first side **111** of the body **110** along a first axis A**1** and a second arm **130** extending from the second side **112** of the body **110** along a second axis A**2**. The first axis A**1** is oblique to the second axis A**2** when the cushion sleeve **100** is unwrapped such that the first arm **120** engages the second arm **130** when the cushion sleeve **100** is wrapped around the bundle **20** of cables **30**.

Alternatively, as shown in FIG. **1**B, the first axis A**1** is oblique to the first side and parallel to the second axis A**2** when the cushion sleeve **100** is unwrapped such that the first arm **120** engages the second arm **130** when the cushion sleeve **100** is wrapped around the bundle **20** of cables **30**.

As shown in FIG. **1**A, the first arm **120** includes a channel **121** for receiving the cable tie **10**. Preferably, the channel is U-shaped (FIG. **2**A), but it is likewise contemplated that the channel **121** is C-shaped (FIG. **2**B) or any other suitable shape for receiving the cable tie **10**.

Additionally, as shown in FIG. **1**A, the second arm **130** includes an opening **131** for receiving the first arm **120** and releasably connecting the first arm **120** to the second arm **130**. Preferably, the shape of the opening **131** corresponds to the shape of the channel **121**. For example, as shown in FIG. **1**A, the opening **131** is U-shaped, but it is likewise contemplated

that the opening **131** is C-shaped or any other suitable shape corresponding to the shape of the channel **121**.

As shown in FIG. **3**, the cushion sleeve **100** is positioned on the support member **40**.

As shown in FIG. **4**, the bundle **20** of cables **30** is positioned on the body **110** of the cushion sleeve **100**.

As shown in FIG. **5**, the first arm **120** of the cushion sleeve **100** is wrapped around the bundle **20** of cables **30**.

As shown in FIG. **6**, the second arm **130** of the cushion sleeve **100** is wrapped around the bundle **20** of cables **30**.

As shown in FIG. **7**, the first arm **120** of the cushion sleeve **100** engages the second arm **130** of the cushion sleeve **100**. More particularly, the opening **131** in the second arm **130** of the cushion sleeve **100** receives the channel **121** of the first arm **120** of the cushion sleeve **100** and releasably connects the first arm **120** of the cushion sleeve **100** to the second arm **130** of the cushion sleeve **100**.

As shown in FIG. **8**, the cable tie **10** is installed diagonally about the bundle **20** of cables **30** and the support member **40**. The cable tie **10** is single-looped, but it is likewise contemplated that the cable tie **10** is multi-looped, for example, double-looped or triple-looped, to further increase the strength of the connection.

As shown in FIG. **9**, the channel **121** receives the cable tie **10** when the cable tie **20** is secured around the cushion sleeve **100**, the bundle **20** of cables **30**, and the support member **40**.

While this invention has been described in conjunction with the exemplary embodiments outlined above, various alternatives, modifications, variations, and/or improvements, whether known or presently unforeseen, may become apparent. Accordingly, the exemplary embodiments of the invention as set forth above are intended to be illustrative, not limiting. Various changes may be made without departing from the spirit and scope of the invention.

The invention claimed is:

1. A cushion sleeve comprising:

a body receiving a bundle of cables, the body disposed between the bundle of cables and a support member, the body having a first side and a second side spaced apart from the first side, the body receiving the bundle of cables along a body axis, the body axis disposed between the first side and the second side and parallel to a longitudinal axis of the bundle of cables;

a first arm disposed about the bundle of cables and between the bundle of cables and a cable tie, the first arm integrally formed with the body and extending from the first side of the body along a first arm axis; and

a second arm disposed about the bundle of cables and between the bundle of cables and the cable tie, the second arm integrally formed with the body and extending from the second side of the body along a second arm axis,

wherein, when the cushion sleeve is laid flat entirely in a single plane, the first arm axis is oblique relative to the body axis and the second arm axis such that, when the cushion sleeve is disposed about the bundle of cables, the first arm engages the second arm.

2. The cushion sleeve of claim **1**, wherein the first arm includes a channel for receiving the cable tie.

3. The cushion sleeve of claim **2**, wherein the channel is U-shaped.

4. The cushion sleeve of claim **2**, wherein the channel is C-shaped.

5. The cushion sleeve of claim **1**, wherein the second arm includes an opening for receiving the first arm.

6. The cushion sleeve of claim **5**, wherein the opening releasably connects the first arm to the second arm.

7. The cushion sleeve of claim **5**, wherein the opening is U-shaped.

8. The cushion sleeve of claim **5**, wherein the opening is C-shaped.

9. A cushion sleeve comprising:

a body receiving a bundle of cables, the body disposed between the bundle of cables and a support member, the body having a first side and a second side spaced apart from the first side, the body receiving the bundle of cables along a body axis, the body axis disposed between the first side and the second side and parallel to a longitudinal axis of the bundle of cables;

a first arm disposed about the bundle of cables and between the bundle of cables and a cable tie, the first arm integrally formed with the body and extending from the first side of the body along a first arm axis; and

a second arm disposed about the bundle of cables and between the bundle of cables and the cable tie, the second arm integrally formed with the body and extending from the second side of the body along a second arm axis,

wherein, when the cushion sleeve is laid flat entirely in a single plane, the first arm axis is oblique relative to the body axis and parallel to the second arm axis such that, when the cushion sleeve is disposed about the bundle of cables, the first arm engages the second arm.

10. The cushion sleeve of claim **9**, wherein the first arm includes a channel for receiving the cable tie.

11. The cushion sleeve of claim **10**, wherein the channel is U-shaped.

12. The cushion sleeve of claim **10**, wherein the channel is C-shaped.

13. The cushion sleeve of claim **9**, wherein the second arm includes an opening for receiving the first arm.

14. The cushion sleeve of claim **13**, wherein the opening releasably connects the first arm to the second arm.

15. The cushion sleeve of claim **13**, wherein the opening is U-shaped.

16. The cushion sleeve of claim **13**, wherein the opening is C-shaped.

17. A cushion sleeve comprising:

a body receiving a bundle of cables, the body disposed between the bundle of cables and a support member, the body having a first side and a second side spaced apart from the first side, the body receiving the bundle of cables along a body axis, the body axis disposed between the first side and the second side and parallel to a longitudinal axis of the bundle of cables;

a first arm disposed about the bundle of cables and between the bundle of cables and a cable tie, the first arm integrally formed with the body and extending from the first side of the body along a first arm axis, the first arm having a cross-sectional shape; and

a second arm disposed about the bundle of cables and between the bundle of cables and the cable tie, the second arm integrally formed with the body and extending from the second side of the body along a second arm axis, the second arm having a corresponding cross-sectional opening for receiving the first arm with the cross-sectional shape,

wherein, when the cushion sleeve is laid flat entirely in a single plane, the first arm axis is oblique relative to the body axis and the second arm axis such that, when the cushion sleeve is disposed about the bundle of cables, the first arm is releasably connected to the second arm via the opening to secure the bundle of cables.

18. The cushion sleeve of claim **17**, wherein the first arm includes a channel for receiving the cable tie.

19. The cushion sleeve of claim **18**, wherein the channel is U-shaped.

20. The cushion sleeve of claim **18**, wherein the channel is C-shaped.

21. The cushion sleeve of claim **19**, wherein the opening is U-shaped.

22. The cushion sleeve of claim **20**, wherein the opening is C-shaped.

23. The cushion sleeve of claim **17**, wherein the opening is U-shaped.

24. The cushion sleeve of claim **17**, wherein the opening is C-shaped.

* * * * *